REMARKS

Claims 4-30, 45, 46 and 48-52 are pending. By this Amendment, claims 45, 46 and 48-52 are amended.

An Election of Species was required in this application. Accordingly, Applicant elected Species II, Figs. 8-18. Applicant asserts that claims 4-30, 45, 46 and 48-52 read on elected Figs. 8-18.

Claims 4, 5, 14, 15, 19-21, 25, 26 and 48-51 were rejected under 35 U.S.C. §102(e) over Kijima et al. (Kijima), U.S. Patent No. 6,661,451. The rejection is respectfully traversed.

Kijima fails to disclose a digital camera with a processor for light metering read signals of given pixels located in a given area narrower than the whole imaging area of the image sensor, and including a timer for determining a time length from a start of the accumulation of charge to a time when a signal from the image sensor reaches a predetermined level, the light metering being on the basis of the time length, as recited in claim 4.

Page 2 of the Office Action asserts that 1/60 sec. is used as a predetermined level and Kijima's light metering (AE) operation is set on the basis of the determined time length of 1/60 sec. This is not correct because 1/60 sec. cannot be used for both a predetermined level and a measured time length.

In order to illustrate the differences between the features recited in claim 4 and Kijima, Applicant attaches Figs. A and B. Fig. A illustrates a supplementary view of the light metering of attached Fig. 15 and Fig. B illustrates the light metering of Kijima.

As should be appreciated by one of ordinary skill in the art, the time required for the image sensor to output a signal at a predetermined level varies based on the brightness of the subject. As shown in Fig. A, assume that t1, t2 and t3 are 1/2048, 1/1024 and 1/512 sec.,

respectively, for example, and the accumulated charge level at each time is V1, V2 and V3. Also assume that the predetermined level is Vth.

As shown in Fig. 15, the accumulated charge is read from the light receiving element in block 1 at time t1 and at block 2 at time t2, but the charge level at these times do not yet reach the predetermined level Vth. At time t3, the accumulated charge level read from block 3 exceeds the predetermined level for the first time. Accordingly, a time length from a start of the accumulation of charge to a time when a signal from the image sensor reaches a predetermined level Vth is time t3.

As shown in Fig. B, Kijima measures a level Vout of the accumulated charge for every T sec. interval. Based on Vout and T, light metering is computed. That is, Kijima fails determine if the signal from the image sensor 12 reaches a predetermined level, but instead uses a variable Vout (that changes based on the brightness of the subject) and a preset T for light metering. Because Kijima fails to determine if the signal from the image sensor 12 reaches a predetermined level, Kijima fails to determine a time length from a start of the accumulation of charge to a time when a signal from the image sensor reaches a predetermined level, as recited in claim 4 as well as the additional features recited in the dependent claims.

Kijima also fails to disclose a digital camera with an image sensor having a plurality of two dimensionally arranged pixels capable of selectively reading out signals from desired pixels for the purpose of at least two of the processes for light metering, focus detection, white balance calculation and picture image forming for recording, wherein, in response to completion of an output of a certain signal from the image sensor, a signal for implementing another process is output in parallel with immediate process of the signal, as recited in claim 48. Support for the amended features of claim 48 can be found, for example, on page 22, line 35 - page 23, line 14 of Applicant's specification.

As shown in Figs 12-15 of Kijima, the control data for AF, AWB and AE is repeated at calculated intervals of 1/60 second in accordance with the image data obtained in the q-addition mode so that the AF control, the AWB control and the AE control are performed (col. 15, lines 12-16). In other words, control data for AF, AWB and AE are taken for every one frame (1/60 second). As such, Kijima fails to output a signal for implementing another process in parallel with the immediate process of the signal.

Kijima also fails to disclose a digital camera with a first processor for processing outputs from individual pixels of the image sensor to form a picture image for recording of an object of the camera, as recited in claims 49 and 50 and as similarly recited in claim 51, or the process of picture image forming for recording as recited in claim 48.

As shown in Figs. 12-15 of Kijima, the process to form an image (still image) is a process for forming an image to display on an LCD. By using the read data for displaying the motion image without a reset, processing of any of light metering (AE), focus detection (AF) and white balance calculation (AWB) is performed. Conversely, the process for forming an image of claims 49-51 is a process for recording a still image. Kijima thus fails to disclose all of the features recited in claims 49-51.

Kijima also fails to disclose a digital camera, wherein upon completion of all the light metering with the second processor (for processing the added signal of the image sensor for light metering of the object), all pixels are read out and processed with the first processor (for processing outputs from individual pixels of the image sensor to from a picture image for recording of an object of the camera), thereby being recorded without resetting the image sensor, as recited in claims 49 and 50.

Kijima also fails to disclose a digital camera, wherein upon completion of the process with the white balance calculator (for processing the added signals of the image sensor in accordance with all of a same kind of color filters), all pixels are read out and processed with

the processor (for processing outputs from individual pixels of the image sensor to form a picture image for recording of an object of the image), thereby being recorded without resetting the image sensor, as recited in claim 51.

As shown in Figs. 12-15 of Kijima, the automatic exposure adjustment (AE) calculation and the automatic white balance adjustment (AWB) continue after the still image process. Accordingly, Kijima does not complete all of the light metering with the second processor or complete the process with the white balance calculator before all pixels are read out and processed with the first processor, as recited in claims 49-51.

For reasons similar to claim 4, Kijima also fails to disclose a digital camera with a second processor that includes a timer for determining a time length from a start of the accumulation of charge to a time when the added signal reaches a predetermined level, the light metering being in accordance with the time length, as recited in claim 50

It is respectfully requested that the rejection be withdrawn.

Claims 4 and 14-16 were rejected under 35 U.S.C. §103(a) over Hieda et al. (Hieda), U.S. Patent No. 6,353,488, in view of Yamaguchi et al. (Yamaguchi), U.S. Patent No. 6,342,921 and claims 45 and 52 were rejected under 35 U.S.C. §102(e) over Hieda. The rejections are respectfully traversed.

Hieda and Yamaguchi fail to disclose or suggest a digital camera with a processor for light metering read signals of given pixels located in a given area narrower than the whole imaging area of the image sensor, and including a timer for determining a time length from a start of the accumulation of charge to a time when a signal from the image sensor reaches a predetermined level, the light metering being on the basis of the time length, as recited in claim 4.

In Hieda, similar to Kijima, a horizontal synchronization pulse HD and a vertical synchronization pulse VD are supplied from a timing generating circuit 11. The frame

signals SG2 and SG3 are generated on the basis of the signals HD and VD. As such, Hieda fails determine if the horizontal synchronization pulse HD and the vertical synchronization pulse VD reaches a predetermined level, but instead uses a variable pulse (that changes based on the brightness of the subject) and a preset time from the timing generating circuit. As such, Hieda fails to disclose or suggest the time length of claim 4.

Yamaguchi fails to overcome the deficiencies of Hieda because Yamaguchi applies pulses at preset times. By applying pulses at preset times, Yamaguchi fails to determine a time length from a start of the accumulation of charge to a time when a signal from the image sensor reaches a predetermined level, as recited in claim 4

In view of the foregoing, Hieda and Yamaguchi fail to disclose or suggest all of the features recited in claim 4 as well as the additional features recited in the dependent claims.

Hieda also fails to disclose a digital camera with an output reader for reading out an output signal to cause signals of the pixels being continuously formed to be output once again from the image sensor for the purpose of at least a second process without resetting the image sensor after signals of the pixels for a first process are output from the image sensor, as recited in claim 45.

Fig. 12 of Hieda discloses that AF, AE and AWB are controlled respectively during a single VD cycle in response to a VD interruption. Hieda thus uses the same signal from the pixel that is read from the sensor. Accordingly, Hieda fails to read out a signal for implementing another process from the image sensor once again without resetting the image sensor after reading a signal for implementing one process from the image sensor. Accordingly, Hieda fails to disclose all of the features recited in claim 45.

Hieda fails to disclose a digital camera with a processor for processing outputs from the pixels of the image sensor to form a picture image for recording of an object of the camera; and a white balance calculator that reads out and processes signals once again from

the pixels of the image sensor without resetting the signals of the image sensor, after completion of reading out from the image sensor for the process of the processor, as recited in claim 52.

As discussed above, Fig. 12 of Hieda discloses AF, AE and AWB are controlled respectively during a single VD cycle in response to a VD interruption. As such, Hieda process the AF, AE or AWB uses the signal read for the video output. Accordingly, Hieda fails to read out and process signals once again from the pixels of the image sensor without resetting the signals of the image sensor, as recited in claim 52.

In Hieda, similar to Kijima, the process to form an image (still image) is a process for forming an image to display a motion image on an LCD. By using the read data for displaying the motion image without a reset, processing of any of light metering (AE), focus detection (AF) and white balance calculation (AWB) is performed. Conversely, the process for forming an image of claim 52 is a process for recording a still image. Hieda thus fails to disclose all of the features recited in claims 52 or the process of picture image forming for recording as recited in claim 45.

It is respectfully requested that the rejections be withdrawn.

Claim 46 was rejected under 35 U.S.C. §102(e) over Hata, U.S. Publication No. US 2004/0061801. The rejection is respectfully traversed.

Hata fails to disclose an image sensor having a plurality of two dimensionally arranged pixels capable of selectively reading out signals from desired pixels for the purpose of at least two of the processes for light metering, focus detection, white balance calculation and picture image forming for recording; the image sensor having a plurality of amplifiers built in the image sensor of variable gain for amplifying the signals of the pixels, respectively as recited in claim 46.

Page 4 of the Office Action argues that claim 46 does not require the plurality of amplifiers to be built in the image sensor. By this Amendment, claim 46 has been amended to clarify that the plurality of amplifiers are built in the image sensor. As shown in Figs. 1 and 2, although Hata discloses a VG amplifier 105 and a digital gain control module 1075, the VG amplifier 105 and the digital gain control module 1075 are not gain amplifiers located in a single image sensor (CCD 103).

In view of the foregoing, Hata fails to disclose all of the features recited in claim 46. It is respectfully requested that the rejection be withdrawn.

Claims 4-14, 17, 18 and 22-24 were rejected under 35 U.S.C. §102(b) over Suzuki et al. (Suzuki), U.S. Patent No. 5,751,354 in view of Yamaguchi. The rejection is respectfully traversed.

Suzuki and Yamaguchi fails to disclose a digital camera with a processor for light metering read signals of given pixels located in a given area narrower than the whole imaging area of the image sensor, and including a timer for determining a time length from a start of the accumulation of charge to a time when a signal from the image sensor reaches a predetermined level, the light metering being on the basis of the time length, as recited in claim 4.

In Suzuki, similar to Kijima, a fine adjustment is performed where a signal of a range finding area is read out (for example, in step S228) and an exposure amount is derived based on the signal (step S228, col. 12, lines 26-57). However, Suzuki uses a preset time period to perform the fine adjustment. As such, Suzuki fails to determine if the exposure amount reaches a predetermined level, but instead uses a variable exposure (that changes based on the brightness of the subject) and a preset time. As such, Suzuki fails to disclose or suggest the time length of claim 4.

Yamaguchi fails to overcome the deficiencies of Suzuki because Yamaguchi applies pulses at preset times. By applying pulses at preset times, Yamaguchi fails to determine a time length from a start of the accumulation of charge to a time when a signal from the image sensor reaches a predetermined level, as recited in claim 4

In view of the foregoing, Suzuki and Yamaguchi fail to disclose or suggest all of the features recited in claim 4, as well as the additional features recited in the dependent claims. It is respectfully requested that the rejection be withdrawn.

Claims 27-29 were rejected under 35 U.S.C. §103(a) over Kijima in view of JP11-344662 (JP'662), and claim 30 was rejected under 35 U.S.C. §103(a) over Kijima in view of JP'622 and in view of JP 09-184973 (JP'973). The rejections are respectfully traversed.

JP'662 and JP'973 fail to overcome the deficiencies of Kijima as applied to claim 4. It is respectfully requested that the rejections be withdrawn.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

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MAC:SMS/tea

Attachments:
Request for Continued Examination
Petition for Extension of Time
Figs. 15, A and B

Date: August 5, 2005

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